

Lord Kelvin and other members of the Royal Society, but I only received it this morning, as I was away from home. I observe that most of those who have signed it are (as they themselves say) not members of Convocation, and consequently not constituents of mine. Still, I should welcome any opportunity of co-operation with such high authorities in the promotion of those interests which we all have at heart. I regret, however, that before publishing the letter they did not give me an opportunity of conferring with them, in which case, I think, I could have given good reasons for what I have said in my letter to Prof. Foster. I am glad to observe that the only point objected to is the reference of any new charter to Convocation. In this, however, I am not asking that any privilege which they do not at present possess should be conferred on my constituents, but only supporting what is now their legal right. As the law now stands no change can be made in the charter without the consent of the graduates. This right I know they highly value, and it is surely natural that, as their representative, I should do my best to preserve it. Moreover, in view of the difficulty of passing a Bill strongly opposed, as any Bill would be, which seeks to abrogate the present right of veto possessed by Convocation, I can imagine nothing more likely to wreck any scheme such as you desire than to link it, quite unnecessarily, with an attack on that right. Your objection to the reference to Convocation implies the belief that a Statutory Commission would arrange a wise charter for the University, and that the graduates would reject it. But why should it be assumed that they would do so? It has been my proud boast that I represent a constituency second to none in education and ability, and I am sure you will not, on reflection, be surprised if I have every confidence that when any new charter is submitted to my constituents, they will exercise the rights well and wisely, and with an earnest wish to further the interests of Learning and Education.

"I am, yours very sincerely,
"JOHN LUBBOCK."

I must also ask you to let me say a few words on your own article.

In the first place, I have not "accepted the views" of those who altogether oppose the Reorganisation Scheme. Some, indeed, of the modifications suggested seem to me important improvements, but that is a very different thing.

You say that Convocation is only one of the bodies affected. In the case of the Colleges and Medical Institutions certain privileges are granted, but the University is the only body whose constitution it is proposed to change.

At present, this cannot be done without the consent of Convocation, and you blame me for endeavouring to maintain that right. Your whole article assumes that the Commissioners will make a wise scheme, and then you allege that a reference to Convocation would wreck it. This, however, is an attack on my constituents and not on me.

High Elms, July 15.

JOHN LUBBOCK.

The Density of Molten Rock.

IN a review of Lord Kelvin's "Geology," in NATURE, July 26, 1894, vol. 1. p. 292, the question of whether solid rock sinks or swims in molten rock was left open for further experimental evidence.

My impression is that this was in accordance with the views of the writer of the book; but if I had had proper acquaintance with the work of Mr. Carl Barus, of the Smithsonian Institution, Washington, I should at least have referred to it. Permit me to do so now, and to give the references:—*Am. Journ. of Science*, 1893, vol. xlv. p. 1; *Phil. Mag.*, 1893, vol. xxiv. p. 1; vol. xxxv. pp. 173 and 296; also certain *Bulletins* of the U.S. Geological Survey, particularly No. 103, which contain the most complete account.

OLIVER J. LODGE.

The Earliest Magnetic Meridians.

IN NATURE of June 6, p. 129, Captain E. W. Creak, F.R.S., questions a statement of mine with regard to this subject, as published in NATURE of May 23, p. 80. I there credited Yeates instead of Duperrey with the first construction of the magnetic meridians for the whole earth. I was careful not to say that Yeates *originated* the idea of magnetic meridians.

Euler, to my knowledge, about the middle of last century, appears to have first appreciated the importance of those lines from a theoretical standpoint. He defines them as those curves on the earth's surface, the tangents to which mark out the

actual direction of a compass needle. He did not actually construct them, however, if I remember correctly.¹

It was my belief then that Yeates first drew these curves, as based upon observations. Captain Creak, however, thinks that John Churchman deserves this honour.

So far as I know, Churchman published but two magnetic charts or atlases, one in 1790, the other in 1794. The chart referred to by Captain Creak is the earlier one, if I mistake not. A text to this chart was also published, called "An Explanation of the Magnetic Atlas," Philadelphia, 1790. It was my belief that this was an isogonic chart—a chart giving the lines of equal variation—not a chart of the magnetic meridians. Churchman's later work, "The Magnetic Atlas or Variations Charts," London, 1794, contains charts which, according to Prof. Hellmann, are more theoretical. Prof. Hellmann mentions and briefly describes both of Churchman's charts, and gives the impression that they are isogonic charts.²

As I have no means at present of verifying this matter, may I ask Captain Creak to make further examination, and state if Churchman's magnetic meridians are based upon observation?

L. A. BAUER.

The University of Chicago, June 29.

Curious Habit of the Spotted Flycatcher.

I HAVE been watching, at intervals during the last week, a pair of Spotted Flycatchers feeding their young in a nest on a ledge of the wall of this house. The nest is embowered by a very free blossoming white rose. I noticed to my surprise the parent birds again and again, after taking food to their offspring, plucking off the petals of the rose near the nest, and transporting them to an acacia tree about ten yards distant, where they let the petals drop upon the ground. The rose blossoms are now quite cleared away from the neighbourhood of the nest, and the lawn beneath the acacia thickly strewn with them.

The rose flowers do not obstruct the approach to the nest, to which the birds have access by running a short distance along the ledge. It is also difficult to suppose that the object of the birds is to admit more air and light to the nest, which is more open to the sunlight than very many nests of this species which I have found. Moreover, the birds take no trouble to remove any of the dead leaves which are near the nest, having an objection, as it appears, only to the blossoms of the rose. I can offer no explanation of this curious conduct of the flycatchers.

W. CLEMENT LEY.

Sellack Vicarage, Ross, Herefordshire, July 11.

A Brilliant Meteor.

ON Sunday, July 7, about 10.45 p.m., I observed a meteor of rather peculiar character. Contrary to the general method of appearance of these objects, it came into view very gradually, and its motion was so uniform and slow that its form could be clearly discerned.

The meteor was double, the two components being about $\frac{1}{4}$ ° apart, but travelling together, the smaller one being ahead of the larger. The combined magnitude was probably equal to that of Venus as seen earlier on the same evening.

Some trace of trail could faintly be made out, but this was rendered uncertain by the sky being very luminous in consequence of the moon's position near the meridian at the time.

While visible the meteor travelled about 20° in a path approximately parallel to the horizon, and a rough estimate of its position would be:

	R.A.	Decl.
Appearance ...	13h.	+ 20°
Disappearance ...	11h. 30m.	+ 35°

No explosion of any kind was noticed, nor any accompanying sound.

CHARLES P. BUTLER.

Royal College of Science, July 9.

Newton and Huygens.

UPON Newton's conception of the universe, space is considered to be void. A fluid or gas would oppose resistance to the motion of the planets, and however small this resistance might be, it would cause a diminution of the linear velocity of the planets. The central attraction being unchanged, a diminution of the linear velocity of the earth

¹ See Gehler's "Physikalisches Woerterbuch," article "Magnetismus."

² "Neudrucke von Schriften und Karten über Meteorologie und Erdmagnetismus," No. 4, p. 22.

would cause an augmentation of its angular velocity around the sun. The period of revolution would take less time, and the length of the year would gradually decrease. Observation proves that this is not the case, and the necessary conclusion is, that there is no resisting medium in space, which must be, therefore, considered as perfectly void.

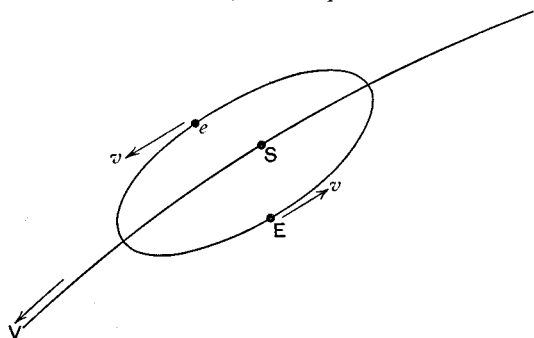
There is no objection to be made to this reasoning so long as we suppose the sun immovable in space, which was the generally accepted belief in Newton's time. But we know at present that the sun, with all the planets, has a motion through space; and this knowledge changes the conditions of the problem, as may be demonstrated by what follows.

In the accompanying figure, *s* is the sun in a certain point of its orbit in space. *E* is the earth in a certain point of its orbit around the sun. Let the linear velocity of the sun in its orbit be *v*, and the linear velocity of the earth in its own orbit be *v'*.

When the earth is on one side of the sun's orbit, say in *E*, then *v* and *v'* are opposite in direction, and the absolute velocity of the earth in space will be $v - v'$. When the earth is on the other side of the sun's orbit, say in *e*, then *v* and *v'* have the same direction, and the absolute velocity of the earth will be $v + v'$.

Now it seems evident that we have here what may be called a self-acting regulation of the angular velocity of the earth in its orbit around the sun. For the absolute linear velocity of the earth is periodically accelerated and retarded, and the mean velocity would remain exactly constant if the sun's orbit were a straight line.

Most probably the sun's orbit through space will prove to be a curve. If this is the case, then the part of the earth's orbit on



the concave or outer side of the sun's orbit will be somewhat longer than the part on the convex or inner side.

If this be so, then the acceleration on the outside part will be somewhat greater than the retardation on the inner side of the earth's orbit. Thus the surplus velocity, gained in each revolution around the sun, will compensate the loss of linear velocity which the earth might suffer in its yearly orbit around the sun by the resistance of a supposed medium in space.

It might, however, be asked, Why it is that this compensation is so exact as we find it to be? For Laplace, in his well-known work on the "Système du monde," explains clearly that no change in the period of revolution of the earth around the sun has been observed.

But we may quite as well wonder why the temperature of our blood is nearly constant; and the best answer to such questions is in the well-known words: "Philosophy does not ask what agrees, but what is."

The sun's motion in space is a discovery with far-reaching consequences for science in general; and if space be allowed, a few other corollaries must follow upon it. For the present, it is better to limit research to the single question as to whether we may admit the existence of a resisting medium in space. The answer is that the discovery of the sun's motion in space allows us to settle this much disturbed question in a positive sense.

This result has a particular value, because it takes away the contradiction between two theories which are both generally admitted. The undulatory theory of light, which was first enunciated by Huygens, supposes the existence of an elastic medium in space. When it is demonstrated that the supposition of this medium is not incompatible with Newton's theory of central forces as applied to our planetary system, this must certainly be considered as a step in advance.

A. HUET.

Delft, Holland, July 5

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THE INTERNATIONAL CATALOGUE OF SCIENTIFIC PAPERS.

THE following report of the International Catalogue Committee was presented to the President and Council of the Royal Society on July 5, and the recommendations contained in it were approved.

At the first meeting of this Committee (February 8, 1894), the Memorial to the President and Council (July 1893) which led to the appointment of the Committee, and the Minute of Council of December 7, 1893, appointing the Committee, having been read, it was resolved to request the President and Council to authorise the Committee to enter directly into communication with societies, institutions, &c., in this country and abroad, with reference to the preparation, by international co-operation, of complete subject and authors' catalogues of scientific literature.

Subsequently, a draft circular letter was prepared, which, on February 22, 1894, received the approval of the President and Council, who also authorised its issue.

This letter was sent to 207 societies and institutions selected from the exchange list of the Royal Society, and to a few others. It was also sent to the Directors of a number of Observatories and of Government geological surveys, to the Foreign Members of the Royal Society, as well as to those of the following Societies:—Chemical, Geological, Physical, Royal Astronomical, Linnean, Royal Microscopical, Entomological, Zoological, Physiological, and Mineralogical, and of the Anthropological Institute. A special letter was addressed to the Smithsonian Institution.

More than a hundred replies to the letter have been received; several of these are reports of Committees specially appointed to consider the suggestions put forward by the Royal Society. A list of answers received up to December 1894, with brief excerpts from the more suggestive, was issued to members of the Committee early in this year. It should, however, be added that from some important institutions no answer has as yet been received.

It may be said at the outset that in no single case is any doubt expressed as to the extreme value of the work contemplated, and that only two or three correspondents question whether it be possible to carry out such a work. It is a great gratification to the Committee that the matter has been taken up in a most cordial manner by the Smithsonian Institution, the Secretary of which, in his reply, refers to the desirability of a catalogue of the kind suggested as being so obvious that the work commends itself at once. The importance of having complete subject catalogues, and not mere transcripts of titles, is also generally recognised.

Some bodies and individuals take the matter up very warmly and urge that steps be taken forthwith to put the scheme into action, this being especially true of the replies received from the United States; others, while giving a general approval, dwell upon the difficulties of carrying out the suggestions put forward; and others, again, ask for more details before committing themselves to any answer which may seem to entail future responsibility, especially of a financial character.

Incidentally it may be pointed out as very noteworthy that over and over again reference is made to the great value of the Royal Society's "Catalogue of Scientific Papers." There is abundant evidence that considerable use is made of this on the continent of Europe. And it is clear that a proposal to carry out a more comprehensive scheme initially under the direction of the Royal Society of London is likely to meet with general approval owing to the fact that the Society is credited with having already carried out the most comprehensive work of the kind yet attempted. Indeed, the Academy of Natural Sciences of Philadelphia, U.S.A., directly advocates the